The Association Between Interpersonal Violence and Unstable Housing Among Veterans

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ABSTRACT

Background:

Despite programs to address housing for Veterans, they continue to be at high risk of unstable housing. Interpersonal violence is also highly prevalent among Veterans and may contribute to unstable housing. Our study aimed to determine whether interpersonal violence was associated with unstable housing among Veterans, and how this association was influenced by common co-occurring conditions such as substance use and mental illness.

Methods:

Veterans in the Mind Your Heart Study ($N = 741$) completed survey data on history of interpersonal violence and access to housing in the prior year. Interpersonal violence was defined as experiencing sexual violence, physical violence, or mugging/physical attack using the Brief Trauma Questionnaire. Multivariable models examined associations between interpersonal violence and unstable housing. Primary models were adjusted for age and sex. Potential explanatory factors were added in subsequent models, including marital status, education, income, substance use disorder, PTSD, and other mental illness.

Results:

Veterans who had experienced interpersonal violence had almost twice the odds of unstable housing after adjustment for age and sex (AOR 1.9, 95% CI 1.2–3.0). This association was attenuated in the fully adjusted model including substance use, PTSD, and other mental illness, illustrating the interdependence of these factors (AOR 1.5, 95% CI 0.91–2.5). Subtypes of interpersonal violence were individually associated with increased odds of unstable housing after adjustment for age and sex (physical abuse AOR 1.7, 95% CI 1.2–2.5; mugging/physical attack AOR 1.8, 95% CI 1.2–2.7; sexual violence AOR 1.4, 95% CI 0.89–2.2), but were no longer significant in the fully adjusted model.

Conclusions:

Previous experiences of interpersonal violence were associated with unstable housing among Veterans. Substance use, PTSD, and other mental illness played an important role in this relationship—highlighting the potential to improve health outcomes through trauma informed approaches that address mental health, substance use, and housing concurrently.

INTRODUCTION

Unstable housing is a growing public health concern in the USA, where over half a million people experience homelessness on any given night.[1] The definition of unstable housing varies but generally includes being without fixed housing or experiencing homelessness, poor housing quality, overcrowded living spaces, and disproportionately high living costs.[2–4] Veterans are at particularly high risk of experiencing unstable housing despite existing government-led programs to address housing for Veterans. In comparison to the general population, Veterans have up to three times the risk of experiencing homelessness.[1,5]

According to the World Health Organization, interpersonal violence "involves the intentional use of physical force or power against other persons by an individual or small group of individuals." Interpersonal violence includes intimate partner violence and stranger violence. It can manifest as physical, sexual, or emotional abuse during childhood or later in life.[6] Veterans are disproportionately impacted by interpersonal violence.[7] A study have found that over half of Veterans experience childhood verbal abuse, 45% experience childhood physical abuse, and 17% experience childhood sexual abuse.[8] Furthermore, as many as one in three female Veterans and one in eight male Veterans experience intimate partner violence.[9,10] Unstable housing and interpersonal violence both negatively impact physical and psychological health.[11,12]

Various forms of interpersonal violence have been associated with unstable housing.[13,14] Interpersonal violence may lead to unstable housing through disruption of social networks and social attachment.[15] It likely interacts with individual, environmental, and societal factors to increase risk of unstable housing over a lifetime.[16] However, few studies of interpersonal violence and unstable housing among Veterans have analyzed the influence of common co-occurring conditions such as substance use disorder (SUD), poverty, and mental

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illness.[17–19] Furthermore, many studies of interpersonal violence have focused primarily on experiences of intimate partner violence among women Veterans.[10,20,21] Although the prevalence of intimate partner violence is likely higher among women, it is also important to examine it among men and to evaluate other subtypes of interpersonal violence.[22]

This study aimed to understand whether exposure to interpersonal violence across the lifespan could be associated with unstable housing among male and female Veterans. Given the high prevalence of interpersonal violence and unstable housing among Veterans, this question was particularly relevant for this large population.[8,22,23] We further evaluated whether lower income, SUD, PTSD, and other mental illness, which are frequently associated with interpersonal violence, explained any connection between interpersonal violence and unstable housing.

METHODS

This study used retrospective data from the Mind Your Heart Study cohort. The detailed methods of the study have been previously described.[24] Between February 2008 and June 2010, 746 outpatients from the Department of Veterans Affairs (VA) sites in San Francisco and Palo Alto completed in-person baseline examinations. Participants were recruited for this study through mailed letters, flyers posted at VA facilities, and provider referrals. The letters were mailed to patients who had attended the VA general medical clinics in the last 5 years. They were mailed to individuals with an International Classification of Disease, 9th revision (ICD-9) code for PTSD and to age matched patients without an ICD-9 PTSD diagnosis. A validated clinical practice guideline for diagnosing PTSD was used to confirm the PTSD diagnosis. All participants provided written informed consent, and the University of California San Francisco Committee on Human Research approved the study. We excluded three participants from these analyses because they were not Veterans and one participant for missing housing data, leaving 741 participants for these analyses.

MEASUREMENTS

Interpersonal Violence

We assessed interpersonal violence using the Brief Trauma Questionnaire (BTQ), which has been validated as a survey instrument in clinical interviews.[25] The BTQ is a 10 item questionnaire. Participants experienced interpersonal violence if they reported "yes" to questions about childhood physical abuse, lifetime mugging/physical attack, or lifetime sexual violence on the BTQ. The question on physical abuse asked "Before the age of 18, were you ever physically punished or beaten by a parent, caretaker, or teacher so that: you were very frightened; or you thought you would be injured; or you received bruises, cuts, welts, lumps or other injuries?" On mugging/physical attack it asked, "Not including any punishments or beatings you already reported in Question 5 (on physical abuse), have you ever been attacked, beaten, or mugged by anyone, including friends, family members or strangers?" On sexual violence it asked, "Has anyone ever made or pressured you into having some type of unwanted sexual contact?"

Unstable Housing

At the baseline examination at the San Francisco VA, participants were asked "Which category best describes your current housing?" with response options: (1) house, (2) apartment/flat, (3) hotel room/boarding house/permanent shelter, (4) retirement community, and (5) other. At the end of the recruitment period, two additional housing questions were asked of 147 participants, "In the last year, has there been a period of time when you did not have a permanent place to stay" and "In the last year, have you been without shelter or stayed in a homeless shelter?" Participants could answer "Yes" or "No" to those questions. These two questions were repeated at the three-year follow up interview for all participants. Our measure of unstable housing was defined as Veterans who reported living in a hotel/boarding house/permanent shelter or "other" (meaning not living in a house, apartment/flat or retirement community), as well as those who reported no permanent place to stay, being without shelter or staying in a homeless shelter in the previous year, during the baseline survey or the three-year follow up survey.

Covariates

Participants self-reported age, sex at birth, race/ethnicity, income, educational attainment, and medical history on the baseline questionnaire. Income was defined as the total household income (before taxes) for the last 12 months from all sources such as wages, Veteran's benefits, social security, retirement income, rent from properties, etc. The Clinician Administered PTSD Scale assessed for PTSD using criteria from the *Diagnostic and Statistical Manual of Mental Disorders (DSM),* Fourth Edition, Text Revision.[26] Licensed clinical psychologists with expertise in PTSD assessment supervised the trained clinicians who conducted the in-person interviews. SUD was defined as a self-reported history of a doctor or nurse telling the participant that they had "alcoholism/drinking problem" or "drug addiction/abuse." Our category, "other major mental illness," included bipolar disorder, major depressive disorder, psychosis, and schizophrenia. The World Health Organization World Mental Health Composite International Diagnostic Interview (WHO WMH-CIDI) was used to assess for lifetime bipolar disorder (type I and type II). DSM IV criteria defined lifetime major depressive disorder.[26] Participants self-reported psychosis or schizophrenia.

Statistical Analysis

We analyzed differences in characteristics between those who did and did not have a history of interpersonal violence using *t*-tests for continuous variables and chi-square tests for

binary or categorical variables. We examined associations between interpersonal violence and unstable housing using multivariable logistic regression models. Using a staged analysis approach, the models were first adjusted for potential confounders that were associated with interpersonal violence with a *P*-value <0.10: age and sex. Potential explanatory factors, including marital status, education, income, PTSD, SUD, and other major mental illness, were then added to the models. There were 115 patients who reported their current housing status only on the baseline interview ("Which category best describes your current housing?") and were missing the two questions asked at the end of the recruitment period ("In the last year, has there been a period of time when you did not have a permanent place to stay" and "In the last year, have you been without shelter or stayed in a homeless shelter?"). We conducted sensitivity analyses excluding these patients from all regression models. Based on *a priori* hypotheses, we also examined additive and multiplicative interactions between interpersonal violence and income. STATA/SE 16.1 (StataCorp; College Station, Texas) was used for all analyses.

RESULTS

Study Population Characteristics Overall and by History of Interpersonal Violence

In this study sample, the mean age was 58.4 (SD 11.3) years. The majority of participants were male (94.3%), white (59.6%), and had graduated from high school (96.4%). Approximately two-thirds of participants were not married (64.6%). One-third reported an income <$20,000, or made less than minimum wage, in the past 12 months (32.0%) and 44.3% reported more than one person living off that income. Sixty-eight percent reported at least one chronic disease. Thirty-eight percent had a SUD, 45.9% had PTSD, and 43.9% had other mental illness including bipolar disorder, major depressive disorder, and psychosis/schizophrenia. Overall, 17.8% of the participants had experienced unstable housing in the last 12 months.

More than two-thirds of the participants had experienced interpersonal violence over their lifetime (69.1%). Characteristics of those with a history of interpersonal violence compared to those without a history of interpersonal violence are shown in Table I. Those with interpersonal violence history were slightly younger, were less frequently married, and reported a lower income. They also reported higher rates of PTSD, SUD, and other major mental illness. A greater proportion of women reported interpersonal violence on the BTQ compared to men. Of the 42 women who participated in the study, 38 reported experiencing interpersonal violence (90.5%). Sexual violence also disproportionately impacted women. Approximately 89% of women Veterans (35 of 44) endorsed experiencing sexual violence. By comparison only 19% of men Veterans did so (134 of 699) (*P* <0.05) (Table I).

TABLE I. Characteristics of Participants by History of Interpersonal Violence

Factor	No History of IV	History of IV	*P*-value
N	229 (30.9)	512 (69.1%)	
Age, yr. mean (SD)	61.5 (12.7)	57.0 (10.3)	<0.01
Sex			<0.01
Male	225 (98.3%)	474 (92.6%)	
Race/ethnicity			
Latinx/Latin American	17 (7.4%)	39 (7.6%)	0.49
Asian/Pacific Islander	26 (11.4%)	39 (7.6%)	
Black/African American	44 (19.2%)	116 (22.7%)	
White	134 (58.5%)	294 (57.4%)	
Other	8 (3.5%)	24 (4.7%)	
Education			0.67
High school graduate	222 (96.9%)	492 (96.1%)	
Marital status			0.02
Married/partnered	96 (41.9%)	166 (32.4%)	
Income			0.03
<$20,000/year	60 (26.2%)	177 (34.6%)	
Income			0.28
$20,000–$29,999	27 (11.8%)	62 (12.1%)	
$30,000–$39,999	41 (17.9%)	77 (15.0%)	
$40,000–$49,999	24 (10.5%)	53 (10.4%)	
$50,000–$60,000	26 (11.4%)	48 (9.4%)	
<$20,000	60 (26.2%)	177 (34.6%)	
>$60,000	50 (21.8%)	92 (18.0%)	
Number dependents on income			0.22
1 person	118 (51.5%)	292 (57.0%)	
2 people	85 (37.1%)	146 (28.5%)	
3–4 people	21 (9.2%)	59 (11.5%)	
5–6 people	3 (1.3%)	8 (1.6%)	
Chronic Medical Conditions			
Hypertension	117 (51.1%)	258 (50.4%)	0.94
Heart Attack	23 (10.0%)	52 (10.2%)	1.00
Heart Failure	14 (6.1%)	30 (5.9%)	1.00
Stroke	15 (6.6%)	30 (5.9%)	0.74
Diabetes	40 (17.5%)	90 (17.6%)	1.00
Substance Use Disorder	60 (26.2%)	222 (43.4%)	<0.01
PTSD	68 (29.7%)	272 (53.1%)	<0.01
Major Mental Illness	64 (27.9%)	261 (51.0%)	<0.01
Unstable Housing	25 (10.9%)	107 (20.9%)	<0.01
House	106 (46.3%)	188 (36.7%)	0.05
Apartment/Flat	98 (42.8%)	239 (46.7%)	
Hotel/Boarding House	10 (4.4%)	36 (7.0%)	
Retirement Community	1 (0.4%)	5 (1.0%)	
None of the above/Other	11 (4.8%)	43 (8.4%)	
Homeless Shelter	6 (2.6%)	46 (9.0%)	<0.01
No Permanent Place to Stay	11 (4.8%)	65 (12.7%)	<0.01

Interpersonal Violence and Unstable Housing

More Veterans with interpersonal violence history reported unstable housing in the previous year when compared to

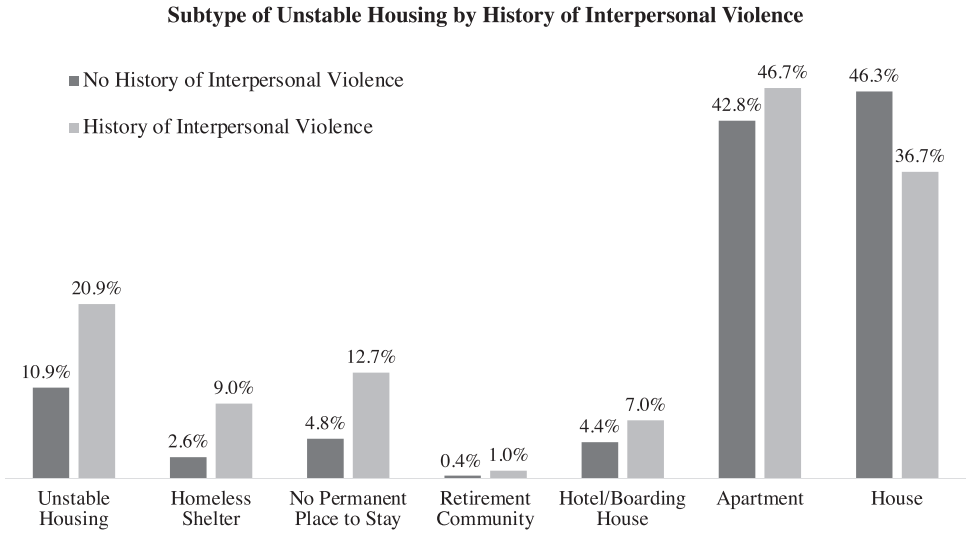

FIGURE 1. Subtype of unstable housing by history of interpersonal violence. Participant responses to housing questions are shown, grouped by history of interpersonal violence. More participants with a history of interpersonal violence reported unstable housing in the previous year compared to participants without history of interpersonal violence. Values shown are percentages.

those without interpersonal violence history (20.9% *vs* 10.9%, $P < 0.01$) (Fig. 1). Veterans who had experienced interpersonal violence had significantly higher odds of unstable housing (OR 2.2, 95% CI 1.4–3.4, $P < 0.01$) (Table S1). Even when adjusting for age and sex, the odds of unstable housing remained elevated and statistically significant (AOR 1.9, 95% CI 1.2–3.0, $P < 0.01$) (Table II). When potential explanatory covariates, such as income, SUD and other major mental illness were added to the model, the odds of unstable housing decreased and was no longer significant (AOR 1.5, 95% CI 0.91–2.5, $P = 0.07$). Sensitivity analyses excluding the patients with incomplete housing data did not show substantial differences (see Table S2). There was also no significant additive or multiplicative interaction between interpersonal violence and income.

Types of Interpersonal Violence and Unstable Housing

After adjusting for confounders, participants with childhood physical abuse had 1.7 times the odds of unstable housing compared to those who had never been physically abused during childhood (AOR 1.7, 95%CI 1.2–2.5, $P < 0.01$) (Table III). The odds decreased to 1.4 (95%CI 0.90–2.1, $P = 0.11$) with the addition of the potential explanatory covariates. Participants who had ever been attacked, beaten, or mugged by someone had 1.8 (95%CI 1.2–2.7, $P < 0.01$) times the adjusted odds of unstable housing than those who had not experienced this trauma. This risk was reduced to 1.4 (95% 0.89–2.1, $P = 0.11$) with the addition of potential explanatory covariates. Lifetime sexual violence was similarly not associated with unstable housing in the fully adjusted models (AOR 1.1 95%CI 0.67–1.8, $P = 0.58$). Findings from sensitivity analyses excluding the patients with incomplete housing data were comparable (Table S3).

TABLE II. The Association between Interpersonal Violence and Unstable Housing in Veterans. The First Multivariable Analyses Were First Adjusted for the Confounders: Age and Sex. The Second Multivariable Analyses Were Adjusted for (1) the Confounders: Age and Sex, as Well as (2) the Potential Explanatory Factors: Education, Marital Status, Income, PTSD, Other Major Mental Illness, and Substance Use Disorder

	Unadjusted OR (95% CI)	Multivariable AOR (95% CI) confounders	Multivariable AOR (95% CI) confounders and explanatory factors
Interpersonal Violence	2.2 (1.4–3.4)	1.9 (1.2–3.0)	1.5 (0.91–2.5)
Age, years mean (SD)	–	0.97 (0.95–0.99)	0.97 (0.97–1.0)
Female Sex	–	1.7 (0.83–3.4)	1.5 (0.70–3.1)
High School Education		–	0.56 (0.23–1.4)
Marital status (married/partnered)	–	–	0.67 (0.40–1.1)
Income	–	–	3.2 (2.1–5.0)
PTSD	–	–	1.3 (0.82–2.0)
Other Major Mental Illness	–	–	1.2 (0.79–1.9)
Substance Use Disorder	–	–	1.5 (0.90–2.2)

DISCUSSION

In a cohort of adult Veterans, we found that interpersonal violence was associated with greater risk of unstable housing. Our study focused on the impact of being a target or victim of interpersonal violence rather than a perpetrator. After adjusting for age and sex, Veterans who had a history of

TABLE III. Multivariable Regressions by Subtype of Interpersonal Violence. The First Multivariable Analyses Were First Adjusted for the Confounders: Age and Sex. The Second Multivariable Analyses Were Adjusted for (1) the Confounders: Age and Sex, as Well as (2) the Potential Explanatory Factors: Education, Marital Status, Income, PTSD, Other Major Mental Illness, and Substance Use Disorder

	Unadjusted OR (95% CI)	Multivariable AOR (95% CI) confounders	Multivariable AOR (95% CI) confounders and explanatory factors
Physical Abuse	1.8 (1.2–2.6)	1.7 (1.2–2.5)	1.4 (0.90–2.1)
Mugging/Physical Attack	2.0 (1.3–3.0)	1.8 (1.2–2.7)	1.4 (0.89–2.1)
Sexual Violence	1.7 (1.1–2.5)	1.4 (0.89–2.2)	1.1 (0.67–1.8)

interpersonal violence had almost two-fold higher odds of unstable housing when compared to those without it. Income, SUD, PTSD, and other major mental illness were important explanatory factors in the relationship between interpersonal violence and unstable housing. The association between interpersonal violence and unstable housing was no longer significant when these potential explanatory factors were placed into the model.

Our findings expanded upon important prior work, which has identified an association between interpersonal violence and unstable housing among Veterans.[17–19] Although we also found a positive association between interpersonal violence and unstable housing, it is important to note the potential bidirectionality between them. Interpersonal violence can lead to unstable housing through lost employment, medical costs, legal expenses and loss of social network that may protect against unstable housing.[27–29] However, unstable housing can also increase risk of interpersonal violence[30,31]; people who are chronically homeless or who work panhandling, recycling or trading sex for goods are at particularly high risk of suffering interpersonal violence.[32] Our research furthered understanding of the interaction between interpersonal violence and unstable housing by examining how it was influenced by common co-occurring conditions among a predominately male Veteran population and for multiple subtypes of interpersonal violence.

We found accounting for socioeconomic and psychosocial factors decreased the association between interpersonal violence and unstable housing. Our findings agree with prior theoretical work postulating that pathways to unstable housing are multifactorial.[16] The addition of individual level factors (e.g., SUD, PTSD, other major mental illness) and systemic factors (e.g., income, education) attenuated our results in the fully adjusted models. This attenuation was likely due to the bidirectional pathways that exist between these factors. SUDs, PTSD, and mental illness may disrupt social support networks and lead to unstable housing.[33,34] They can also increase victimization or perpetration of interpersonal violence due to intoxication or mental health crises.[11,35] Finally, unstable housing and interpersonal violence can give rise to SUDs, PTSD, and mental illnesses owing to the psychological stress and trauma they incur.[36,37]

Few studies explicitly look at the relationship between interpersonal violence *and* psychosocial factors as an explanatory model for unstable housing in the Veteran population. A study of homelessness among male Veterans of the Vietnam war found that childhood interpersonal violence, mental illness, and SUD were risk factors for homelessness after discharge from military service. The authors postulated that these childhood traumas derailed normal personal development, leading to psychological damage that increased risk for unstable housing.[38] In the general population, mood, substance use, and personality disorders have been implicated in mediating the relationship between Adverse Childhood Events (ACEs), and homelessness.[17,39] Our study findings support a similar interdependence between interpersonal violence, psychosocial factors and unstable housing.

Income has been shown to be a strong predictor of homelessness.[40] Given this knowledge, we hypothesized that the relationship between unstable housing and interpersonal violence may be dependent on income. Although significantly more Veterans with interpersonal violence reported an income of <20,000/year than those without interpersonal violence, we found no multiplicative or additive interaction between income (<$20,000/year) and interpersonal violence that impacted unstable housing. This suggests that interpersonal violence may be associated with unstable housing at various income levels.

Our research showed that multiple subtypes of interpersonal violence were associated with unstable housing. Our subtypes included childhood physical assault, lifetime mugging/physical attack, and lifetime sexual violence. Studies have shown that trauma that occurs during childhood may place individuals at higher risk of psychiatric disorders and associated with unstable housing.[14] Similarly, intimate partner violence has been strongly associated with unstable housing among women.[13] Therefore, it could be expected that measures of childhood interpersonal violence and lifetime sexual violence would have greater impact on unstable housing. However, we found that the strength of the association with unstable housing was similar among all our subtypes. This finding should be confirmed in larger, diverse populations of Veterans across the USA.

Veterans are over-represented in homeless populations in the USA despite having access to more robust housing resources than the general population. In 2019, the U.S. Department of Veterans Affairs spent $1.8 billion on programs to serve Veterans experiencing homelessness.[1] Our research supports directing funds toward trauma informed housing programs with fully integrated, on-site social work and mental health services, as well as embedded

community-based-organizations that address interpersonal violence. The Aspire to Re-Imagine Safety & Equity (ARISE) is a model of trauma informed care in the healthcare system that demonstrates the importance of pairing screening for interpersonal violence with screening for co-occurring depression and SUD, integrative behavioral health services, and expedited access to counseling.[41] Housing programs could similarly undergo a trauma informed transformation that expands initiatives linking trauma informed care principles and practices with on-site services. In doing so, they may further improve the safety, health, and wellbeing of Veterans who have experienced interpersonal violence. Additionally, to prevent unstable housing among Veterans, our research supports early identification and treatment of interpersonal violence, SUD, and mental illness for military personnel while they are in active duty or early in transitioning to civilian life. This may include expanding the Transition Assistance Program to include universal education on available resources in the Veterans Health Administration or broader civilian community to address interpersonal trauma and common co-occurring conditions.[42]

We acknowledge several limitations in this study. Since this study took place, it is likely that new housing programs for Veterans have been developed. Therefore, their impact will not be observed in our current analysis. The majority of participants identified as white. Prior studies have found demographic variations in rates of homelessness among Veterans.[5] This disparity in unstable housing is linked to a history of racial and ethnic discrimination in the USA.[43] Although we did not find significant differences in housing outcomes by race or ethnicity, this may be due to insufficient sample size. The cohort was enriched for participants with PTSD, and prevalence rates should not be extrapolated to the general population of Veterans. Lifetime history of interpersonal violence was only assessed at baseline but the questions on housing were asked at the baseline and/or Year 3 follow up interviews. It is possible that people in our "no interpersonal violence" group could have experienced interpersonal violence between the baseline and Year 3 assessments. This would likely bias our results toward finding a weaker association between interpersonal violence and unstable housing than the true relationship. Some information on medical conditions were self-reported, which may introduce additional bias through recall bias or underreporting of medical conditions. The BTQ has limitations in its measurement of interpersonal violence. It does not measure various types of violence (e.g., psychological, combat-related violence, forms of childhood abuse other than physical abuse, psychological or financial abuse), address the burden or timing of interpersonal violence over one's lifetime, nor separate intimate partner violence from stranger violence. These factors might have differential impact on the acquisition of housing. Additionally, participants only reported if they had unstable housing in the previous year, which likely underestimates their experiences of unstable housing throughout their lifetime. Most of the variables in the study were measured at single time points. Longitudinal and mixed method studies that capture these varied experiences of interpersonal violence and unstable housing across the lifespan could help untangle their connections.

CONCLUSIONS

This study illustrated the interconnected relationships between interpersonal violence, psychiatric comorbidities, and unstable housing. As the public health challenges of unstable housing and homelessness continue to escalate, identifying interventions for high-risk populations is necessary. Our findings suggest that programs to prevent homelessness and support housing among Veterans may be more successful if they address the traumatic experiences and common co-occurring conditions that people have endured over a lifetime.

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SUPPLEMENTARY MATERIAL

Supplementary material is available at *Military Medicine* online.

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CONFLICT OF INTEREST STATEMENT

None declared.

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